Name: Date:

Polynomial Factoring solution (version 699)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-72}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{10 \pm 6\sqrt{2}\, i}{2}$$

$$x = 5 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 - 3i$ and $-8 + 6i$ in standard form $(a + bi)$.**

Solution

$$(5 - 3i) \cdot (-8 + 6i)$$

$$-40 + 30i + 24i - 18i^2$$

$$-40 + 30i + 24i + 18$$

$$-40 + 18 + 30i + 24i$$

$$-22 + 54i$$

Polynomial Factoring solution (version 699)

3. **Write function $f(x) = x^3 + 9x^2 + 23x + 15$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	9	23	15
-3		-3	-18	-15
	1	6	5	0

$$f(x) = (x+3)(x^2+6x+5)$$

$$f(x) = (x+3)(x+1)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+2) \cdot (x-3)$$

Sketch a graph of polynomial $y = p(x)$.